

A MODEL OF PATIENTS' SATISFACTION WITH TREATMENT FOR POSTTRAUMATIC STRESS DISORDER

Alan Fontana and Robert Rosenheck

ABSTRACT: There is little empirical knowledge about the contribution of treatment effectiveness to patient satisfaction, particularly in the area of mental health. We conducted this study to assess the satisfaction of 3,646 veterans who received treatment from March 1996–April 1997 at specialized inpatient and residential posttraumatic stress disorder programs at Departments of Veterans Affairs in 35 locations. We used structural equation modeling to evaluate and extend a model of connections among pretreatment characteristics, treatment structure, treatment effectiveness and patient satisfaction. The results suggest three implications for mental health administration and program planning: (1) any valid comparison of programs requires that differences in patient characteristics be taken into account, (2) satisfaction and effectiveness are largely separate indices of quality, and (3) shortening the length of stay to contain cost is likely to lower patient satisfaction.

KEY WORDS: patient satisfaction; posttraumatic stress disorder; pretreatment characteristics; treatment effectiveness; veterans.

When evaluating the quality of health care services, patient satisfaction has become an increasingly prominent factor. Often, the assumption has been that satisfaction is influenced heavily by treatment effectiveness, that is, by improvement in health status and/or the reduction of illness (Edwards, Yarvis, Mueller, & Langsley, 1978; Kane, Maciejewski, & Finch, 1997; Rosenheck, Wilson, & Meterko, 1997). However, patient satisfaction may be related to treatment effectiveness only weakly (Kasprow, Fris-

Alan Fontana, Ph.D., and Robert Rosenheck, M.D., are affiliated with the Northeast Program Evaluation Center, a division of the VA National Center for Posttraumatic Stress Disorder, Connecticut Healthcare System, West Haven, Connecticut; and the Yale University School of Medicine, Department of Psychiatry, New Haven, Connecticut.

Address for correspondence: Alan Fontana, Ph.D., Northeast Program Evaluation Center/182, 950 Campbell Avenue, West Haven, CT 06516. E-mail: alan.fontana@med.va.gov.

man & Rosenheck, 1999; Lebow, 1983; Linder-Pelz, 1982). Treatment effectiveness has been represented in several ways, including use of mental health services (Priebe & Gruyters, 1995), posttreatment ratings of success (Edwards et al., 1978), and change in clinical status from pretreatment to posttreatment (Kane et al., 1997). Pre-post change, while the most valid measure, has been the least frequently used measure of treatment outcomes in studies of satisfaction with medical services; and, in the case of mental health, we know of no study of satisfaction that has used pre-post clinical change as the measure of treatment outcomes. Conceptually, pre-post change is preferable to the posttreatment state alone because it is not biased by the patients' pretreatment clinical state, as is the case with the posttreatment state (Kane et al., 1997; Fowler & Jackson, 1991).

The assumption that satisfaction is influenced heavily by treatment effectiveness is incorrect.

When the outcomes are in the mental health area, determining the relationship between treatment outcomes and satisfaction is of particular relevance because satisfaction ratings involve subjective judgments, which potentially are subject to disturbances in mood and cognition—the cardinal features of mental health disorders. For instance, Hoff, Rosenheck, Meterko, and Wilson (1999) found that psychiatric patients were less satisfied with their *medical* care than medical patients were. Greater changes in mood and cognition can be expected for psychiatric patients than for medical patients; therefore, these changes conceivably might exert even more influence on patient satisfaction ratings in the mental health area.

The most consistent findings among studies of satisfaction, however, have been that patient pretreatment characteristics appear to be more influential than effectiveness or any other aspect of treatment (Linder-Pelz, 1982; Rosenheck et al., 1997; Lebow, 1983). Although much inconsistency exists across studies in the direction of the relationships between satisfaction and specific patient characteristics (Carr-Hill, 1992; Greenwood, Key, Burns, Bristow, & Sedgwick, 1999), older age, being married, and lower educational level generally have been associated with greater satisfaction (Rosenheck et al., 1997; Pascoe, 1983). We include 4 of the most commonly reported characteristics in the present study, as well as 2 indicators of traumatic exposure, which are highly relevant to a population of war veterans.

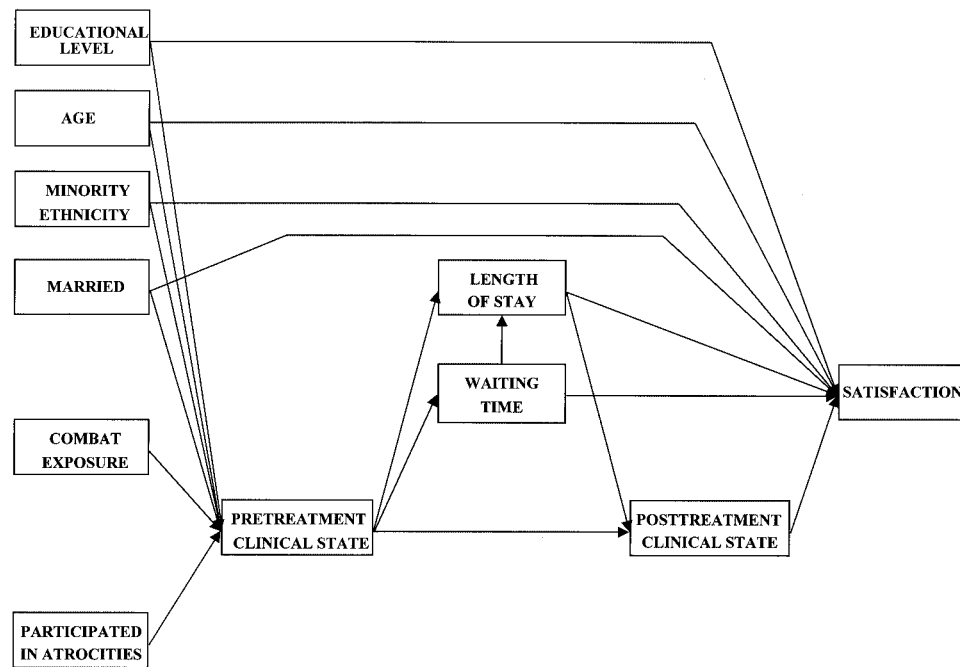
In this study, we posit and evaluate a model of patients' satisfaction with specialized inpatient treatment for posttraumatic stress disorder (PTSD), a condition of special importance to the Department of Veterans Affairs (DVA) because it is a pervasive, adverse consequence of war-zone stress (Kulka et al., 1990). Moreover, specialized inpatient treatment for PTSD is

characterized by high intensity and cost (Fontana & Rosenheck, 1997a). In fiscal year 1997, DVA spent more than \$66 million on specialized treatment for PTSD. Inpatient treatment (\$35 million) accounted for more than 52% of this amount, while accounting for only slightly more than 10% of all the veterans (57,927) receiving specialized PTSD treatment (Fontana, Rosenheck, Spencer, Gray, & DiLella, 1998). The present study has two principal goals. One is to determine the relative magnitude of the contribution of different domains of variables to satisfaction, particularly treatment outcomes and pretreatment characteristics. The other is to determine the extent to which the effect of patient pretreatment characteristics on satisfaction is mediated by treatment outcomes.

Specialized inpatient treatment for PTSD is characterized by high intensity and cost—DVA spent more than \$35 million in 1997.

Our model orders 5 domains of variables in 5 stages as diagrammed in Figure 1. Based on the studies reviewed above, we postulated that patient demographic background (age, educational level, marital status and mi-

FIGURE 1
Postulated Paths in the Theoretical Model



nority ethnicity) and their traumatic exposure in the war zone (combat and participation in atrocities) would affect both their clinical state at admission and their satisfaction with treatment (Kulka et al., 1990; Card, 1983; Fontana & Rosenheck, 1993; Foy, Sippelle, Rueger, & Carroll, 1984; Laufer, Yager, Frey-Wouters, & Donnellan, 1981). We further postulated that patients with worse clinical states at admission would be more quickly admitted by the clinical staff, and the staff would plan to treat them longer. We postulated, however, that patients' actual time on an admission waiting list also would reflect their motivation for treatment and thereby contribute to how long they would be interested in receiving treatment (length of stay). Moreover, we postulated that this positive motivation for treatment would also predispose them to be more satisfied with their treatment. Based on our assumptions that greater lengths of stay reflect both greater motivation for treatment and greater opportunities for receiving treatment, we postulated that longer length of stay would contribute to both better clinical state after treatment and greater satisfaction. Finally, we postulated that treatment effectiveness (clinical state after treatment with clinical state before treatment taken into account) would contribute to greater satisfaction.

METHOD

Subjects

Subjects were 3,646 veterans who received treatment at 35 Department of Veterans Affairs medical centers that had specialized inpatient and residential PTSD programs between March 1, 1996, and April 30, 1997. These programs consist of a mixture of group and individual modalities that target psychiatric symptoms, substance abuse, and social dysfunction. The predominant clinical approach employed is cognitive-behavioral therapy. Data were collected as part of the National Mental Health Program Performance Monitoring System (Fontana & Rosenheck, 1997b). Veterans who are admitted to these programs are assessed with a brief, standardized self-report questionnaire at the time of admission and at 4 months after discharge. A period of 4 months was chosen as the follow-up interval because a previous study of specialized inpatient PTSD treatment showed that there was no significant change in symptoms and social functioning beyond 4 months posttreatment (Fontana & Rosenheck, 1997a). In order to achieve comparability of time periods between pretreatment and posttreatment, the components of pretreatment clinical state (see below) were obtained for the 4 months prior to admission to the treatment programs.

The 2,358 veterans retained as the sample for data analysis were those who provided complete pretreatment information regarding their demo-

graphic background, traumatic war-zone exposure and clinical status, and who were followed up successfully to provide posttreatment information. Sixty-five percent of the total sample were retained veterans who averaged 49.2 ($SD=5.52$) years of age and 12.82 ($SD=2.16$) years of education. Forty-three percent were married currently, and 33% were of minority ethnic ancestry.

Variables

The domain of demographic background variables in the model consisted of age, education, marital status, and ethnic minority group membership as described above. The domain of traumatic war-zone exposure was composed of dichotomous measures of combat: receiving incoming fire (95%) and participating in atrocities (28%).

The severity of clinical status was determined by measurements in five areas of symptomatic and functional adjustment: PTSD, violent behavior, alcohol abuse, drug abuse, and medical condition. PTSD was measured by the Short Form of the Mississippi Scale, an 11-item version, which was developed to be most sensitive to changes in treatment (Fontana & Rosenheck, 1994). Violent behavior was measured as the sum of four dichotomous items that were modeled after items used in the National Vietnam Veterans Readjustment Study (Kulka et al., 1990): destruction of property, threatening someone with a weapon, threatening someone without a weapon, and physically fighting with someone (Cronbach alpha=0.71). Alcohol abuse, drug abuse, and medical condition were measured by composite indices from the Addiction Severity Index (McLellan et al., 1985).

Preliminary analyses indicated that there was significant ($p<.05$) improvement in each outcome measure from pretreatment to posttreatment assessment, and that improvement on each outcome measure was related significantly to satisfaction. Since the same pattern of relationships applied to each measure, we decided that a combination of the five measures would be the most accurate and economical representation of clinical state at baseline and follow-up. For retained veterans, $M=40.77$, $SD=5.54$ for PTSD; $M=0.16$, $SD=0.021$ for alcohol abuse; $M=0.07$, $SD=0.09$ for drug abuse; $M=1.79$, $SD=1.36$ for violence; and $M=0.58$, $SD=0.34$ for medical problems. For retained veterans, we standardized the scores for each measure at a mean of 0 and a standard deviation of 1 at each time point and summed them: $M=0.04$, $SD=2.79$ for clinical state at admission, and $M=0.26$, $SD=2.56$ for clinical state at follow-up. Only the data for retained veterans were used for standardization because retained veterans were the only subjects who had data at both time points.

The domain of treatment structure was represented by the number of days of waiting time for admission ($M=1.34$, $SD=1.22$) and length of stay ($M=41.40$, $SD=23.30$). We categorized waiting time into five levels because

of its skewed distribution: no waiting time ($N=828$), 1 to 29 days ($N=448$), 30 to 89 days ($N=648$), 90 to 179 days ($N=316$), and 180 days or more ($N=118$). This particular categorization was chosen in order to normalize the distribution.

Satisfaction with treatment ($M=17.39$; $SD=3.13$) was measured on 5-point scales as the sum of 4 items (Cronbach alpha=0.84) that were adapted from the Client Satisfaction Questionnaire (Attkisson & Zwick, 1982). These were the four items:

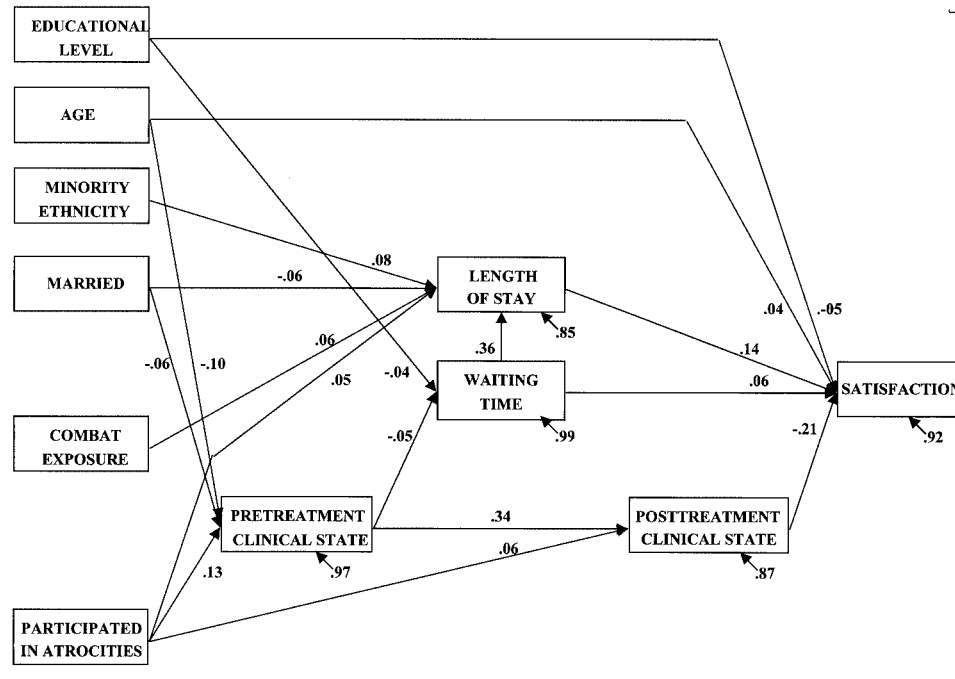
- How satisfied were you with the care you received from the specialized PTSD program? (“not at all satisfied” to “completely satisfied”)
- How would you rate the care you received from the specialized PTSD program? (“poor” to “excellent”)
- If you could have free care outside the VA, would you choose to go to the specialized PTSD program at this VA again? (“definitely would not” to “definitely would”)
- Would you recommend the specialized PTSD program at this VA to other veterans if they needed treatment? (“definitely would not” to “definitely would”)

Data Analysis

Structural equation modeling is an extension of multiple regression analysis that is well suited to the evaluation of a *set* of postulated interrelationships. Statistically, the extension involves the simultaneous solution of the set of equations expressing the interrelationships and the use of all information in deriving each of the parameter estimates in the model (Bollen, 1989; Hayduk, 1987; James, Mulaik, & Brett, 1982). Conceptually, the extension involves specifying a model of linkages that serves as a map to the selection of variables to be included in each equation.

The data analysis proceeded by estimating the initial model and then modifying it by setting nonsignificant paths to zero and by adding paths that modification indices suggested would improve the fit of the data. The modification was evaluated by differences in chi-square, comparative fit (Bentler, 1989), and parsimonious fit (Mulaik et al., 1989) between the models. Values of 0.90 or higher are considered evidence of good comparative fit (Bentler, 1989). While a range of values has not been proposed similarly for parsimonious fit, the generally accepted level of good parsimony is a value of 0.50 or higher. Final parameter estimates are presented in Figure 2, which diagrams the model in its best-fitting, most parsimonious form. Path coefficients are presented as standardized regression (beta) coefficients in order to facilitate their comparison across different paths. As such, they are most comparable to correlation coefficients. Non-causal associations among the exogenous variables were included in the estima-

FIGURE 2
Significant Paths (beta coefficients) Between Variables in the Extended Model, with Disturbance Terms (proportions of unexplained variance) Attached to Each Variable



tion of the model, but, for clarity of exposition, they are not diagrammed in the figures. However, they can be found as components of the correlation matrix in Table 1.

The data were checked for outliers in terms of extreme contributions to multivariate kurtosis, with no cases requiring deletion. Parameter estimation was conducted by generalized least squares because the multivariate kurtosis was more peaked than normal (Mardia, 1970). The CALIS procedure of the SAS software package, Version 6.12 (SAS Institute, 1989), was used to estimate model parameters on the covariance matrix. Before estimating the model's parameters, the data for age, education, and length of stay were rescaled by dividing the values by 10 in order to make the standard deviations more comparable to those of the other variables. Conditioning the data in this manner is recommended in order to obviate problems in estimation (Hatcher, 1994). The small arrows that are attached to each variable, but are not from another variable, indicate the disturbance

TABLE 1
Bivariate Correlations Among Model Variables

<i>Variable</i>	<i>Age</i>	<i>Education</i>	<i>Married</i>	<i>Minority</i>	<i>Combat Exposure in Atrocities</i>	<i>Participated in Atrocities</i>	<i>Pretreatment Clinical State</i>	<i>Waiting Time</i>	<i>Length of Stay</i>	<i>Posttreatment Clinical State</i>
Age	—									
Years of Education	-.05	—								
Married	.13	-.05	—							
Minority				—						
Ethnicity	-.02	-.02	-.07	—						
Combat Exposure	.11	-.02	.03	.00	—					
Participated in Atrocities	-.03	.02	-.01	.02	.09	—				
Pretreatment Clinical State	-.11	-.02	-.06	.05	.03	.13	—			
Waiting Time	.00	-.04	-.02	.00	.02	-.01	-.05	—		
Length of Stay	-.03	.02	-.07	.09	.06	.06	-.02	.36	—	
Posttreatment Clinical State	-.05	-.03	-.03	.02	.01	.11	.35	.01	.01	—
Satisfaction with Treatment	.05	-.05	.04	.04	.05	-.01	.00	.10	.16	-.21

Note. $r = .04$ significant at $p < .05$; $r = .06$ significant at $p < .01$.

for that variable (that is, the proportion of variance for that variable, which is unaccounted for by the model). All significance levels are based on two-tailed tests.

RESULTS

We first compared veterans who we retained for further analyses to other veterans who we dropped on background and model variables. Retained and dropped veterans were not significantly different in years of education, participation in atrocities, severity of PTSD at admission, and length of stay. Retained veterans, however, were 0.88 years older ($t=4.36$, 3564 *df*, $p<.0001$), more often married by 12% (chi-square=44.23 [3567], $p<.001$), less often of minority ethnicity by 7% (chi-square=17.39 [3569], $p<.001$), more exposed to incoming fire by 2% (chi-square=5.60 [3568], $p<.02$), had a slightly longer waiting time ($t=2.22$, 3562 *df*, $p<.03$), and at admission were lower in alcohol abuse ($t=2.66$, 3644 *df*, $p<.01$), drug abuse ($t=4.54$, 3643 *df*, $p<.0001$) and violence ($t=3.04$, 3644 *df*, $p<.003$), and were higher in medical problems ($t=2.21$, 3643 *df*, $p<.03$).

In order to obtain a more focussed picture of the differences between retained and dropped veterans, we performed a logistic regression analysis for all significant variables with retention in the study as the dependent variable. The logistic regression analysis showed that being older (chi-square=7.03, $p<0.01$), married (chi-square=28.93, $p<0.0001$), not of minority ethnicity (chi-square=7.27, $p<0.01$), and having less severe drug use (chi-square=5.66, $p<0.02$) and violence (chi-square=5.85, $p<0.02$) at admission were significant individually with retention. These characteristics suggest that patients who were more integrated socially were easier to locate and follow up than their opposite counterparts.

We proceeded with model evaluation by determining the fit of the theoretical model to the data. The chi-square for the model was 99.85 (22, $N=2358$, $p<0.0001$), with a comparative fit index of 0.909 and a parsimonious goodness-of-fit index of 0.397. These indices mean that the fit of the model was good, but its parsimony was somewhat low. Inspection of path coefficients and modification indices revealed that 16 paths were nonsignificant and that the parsimony of the model could be improved by deleting these paths. Evaluation of the reduced model showed a substantial improvement in the parsimonious goodness-of-fit index to 0.685 with only a minimal decrease in the comparative fit index to 0.903. The chi-square for the reduced model was 120.52 (38, $N=2358$, $p<0.0001$). The difference in chi-square of 20.67 with 16 degrees of freedom is not statistically significant, indicating that the improvement in parsimony was achieved without a significant erosion of fit. Modification indices suggested the inclusion of

six additional paths: from minority ethnicity, married, combat and participation in atrocities to length of stay; from educational level to waiting time; and from participation in atrocities to clinical state after treatment. Inclusion of these paths produced a model with a chi-square of 56.78 (32, $N=2358$, $p<0.005$). The difference in chi-square of 63.74 with 6 degrees of freedom is statistically significant ($p<0.001$), indicating that inclusion of these paths improved the fit of the model significantly. The comparative fit index increased to 0.971, with a slight decrease in the parsimonious goodness-of-fit index to 0.579.

Comparison of significant paths in the final model (Figure 2) to the postulated paths in the theoretical model (Figure 1) shows that 11 of the 18 theoretical paths were significant. Consistent with our postulated paths, older and married patients were better off clinically before treatment, while patients who had participated in atrocities were worse off clinically before treatment. Patients who were worse off clinically before treatment had shorter waiting times and were worse off clinically after treatment when compared to other patients. Patients who had longer waiting times had greater lengths of stay and were more satisfied with treatment. Older and less educated patients, those with longer lengths of stay, and those who were better off clinically after treatment were more satisfied with treatment.

In addition to the postulated paths, six other paths added significantly to the fit of the model. Their inclusion is useful in order to present a more comprehensive picture of the complexity of linkages among the variables in the model. Due to the post hoc nature of these additional paths, however, they should be considered as empirical hypotheses for testing by future research. Minority patients, and those with more combat exposure and greater participation in atrocities, had longer lengths of stay. These paths suggest that these patients, in particular, find specialized inpatient PTSD treatment appealing, perhaps because these treatment programs focus specifically on their war experiences. On the other hand, married patients had shorter lengths of stay, perhaps because the presence of a spouse and a home outside the hospital makes them more appealing than the hospital. Patients with higher educational levels had shorter lengths of stay. This path, in conjunction with the one indicating lower satisfaction, suggests that patients with more education might have higher expectations of accessibility and effectiveness, resulting in a more critical reaction to their treatment experiences. Finally, patients who had participated in atrocities were worse off clinically after treatment as well as before treatment. These paths suggest that the psychopathological sequelae of this type of traumatic exposure are particularly resistant to treatment.

In addition to examining the significance and size of individual path coefficients, it is useful to examine the relative contributions of the effects

of variables individually, and in domains, to the total effects accounted for by the model. We calculated total effects for individual variables and domains of variables without respect to sign in order to determine the percentage contributed by each variable to the total. These values can be found in Table 2. Among domains, patient demographic background contributed 42.4%, and traumatic exposure contributed 13.0%. Taken together, these two domains of patient characteristics accounted for 55.4% of the model's total effects. Treatment structure contributed 26.5%. Patient pretreatment clinical status contributed 5.1% and posttreatment clinical status contributed 13.0%.

DISCUSSION

This is the first large sample study to examine the relationship of clinical change to patients' satisfaction with their treatment. Although the patients' posttreatment clinical state did contribute significantly to their satisfaction, the magnitude of its contribution was relatively small, accounting for only 13% of the effects explained by the model. It is noteworthy that this order of magnitude of explained effects is very similar to that found in a study of pretreatment-to-posttreatment outcomes among medical patients (Kane et al., 1997) and coincides with the conclusions of other inves-

TABLE 2
Total Effects of Model Domains and Variables on Satisfaction

<i>Domains and Variables</i>	<i>Effects</i>	<i>Percentage</i>
<i>Demographic Background</i>	<i>0.75</i>	<i>42.4</i>
Age	0.28	15.8
Years of Education	0.40	22.6
Married	0.03	1.7
Minority Ethnicity	0.04	2.3
<i>Traumatic Exposure</i>	<i>0.23</i>	<i>13.0</i>
Combat	0.12	6.8
Participated in Atrocities	0.11	6.2
<i>Pretreatment Clinical State</i>	<i>0.09</i>	<i>5.1</i>
<i>Treatment Structure</i>	<i>0.47</i>	<i>26.5</i>
Waiting Time	0.28	15.8
Length of Stay	0.19	10.7
<i>Posttreatment Clinical State</i>	<i>0.23</i>	<i>13.0</i>
Total	1.77	100.0

tigators, which is that treatment effectiveness has relatively little impact on patients' satisfaction (Kasprow et al., 1999; Lebow, 1983; Linder-Pelz, 1982). Our model indicates that posttreatment clinical state is largely a function of pretreatment clinical state and, essentially, is not influenced by treatment structure in the form of either length of waiting time or length of stay. Participation in atrocities contributed both directly and indirectly to a worse clinical state posttreatment, while a younger age and being married contributed indirectly through their effects to a worse clinical state pretreatment.

Treatment structure in the form of longer waiting periods and lengths of stay contributed directly to satisfaction, although the size of its effect was small. We attribute longer waiting periods to a greater motivation for treatment that this variable implies, and we suggest that greater motivation for treatment carries with it a greater predisposition to greater satisfaction. Similarly, we suggest that greater satisfaction develops out of the treatment experience so that longer lengths of stay contribute to greater satisfaction.

Admission characteristics outweighed both treatment structure and treatment effectiveness in determining satisfaction.

Patient characteristics accounted for the greatest proportion of effects explained by the model, ranging from 42.4% for demographic background alone to 55.4% when traumatic exposure is included as well. This order of magnitude is consistent with that found by other studies (Kane et al., 1997; Rosenheck et al., 1997; Greenwood et al., 1999; Hermann, Ettner, & Dorwart, 1998). In the present study, the effects of combat and participation in atrocities on satisfaction were mediated entirely by clinical state and length of stay. The effects of age, education, marital status, and minority ethnicity on satisfaction, however, were largely direct, with only 18.7% being mediated by other variables. Among demographic characteristics, older age and lower educational level contributed directly to satisfaction with treatment. Admission characteristics thus outweighed both treatment structure and treatment effectiveness in determining satisfaction.

These findings have three major implications for mental health administration and program planning. One implication is that satisfaction and effectiveness are largely separate. Thus, it would be a mistake to conclude that if satisfaction is high, effectiveness must be high as well. Moreover, we believe that satisfaction should be considered a secondary goal of program design, and that the primary goal should be effectiveness in alleviating the symptoms and social dysfunction that prompt patients to seek treatment in the first place.

It would be a mistake to conclude that if satisfaction is high, effectiveness must be high as well.

A second implication is that increasing efficiency through shortening lengths of stay is likely to be accompanied by decreasing satisfaction. Program planners and administrators should anticipate that lowering the length of stay to achieve greater efficiency will likely be obtained at the cost of lowered satisfaction. This should be recognized when comparing satisfaction ratings over time if substantial reductions in length of stay have been made.

A third implication is that the demographic and historical characteristics that patients bring to treatment make the largest contributions to the patients' satisfaction with treatment. Further, the contributions of these characteristics are largely independent of treatment structure and effectiveness. Faced with this reality, we, along with others, urge that any administrative evaluation of patient satisfaction, particularly involving a comparison among programs, should adjust for differences in baseline patient characteristics across programs (Kane et al., 1997; Rosenheck et al., 1997). Statistical adjustment to the satisfaction ratings, in which these characteristics are included as covariates, is the most practical way to attempt to remove their effects from a comparison, although such adjustments are only approximate. Such an attempt to adjust satisfaction ratings for differences in patients' characteristics must be made in order to arrive at a defensible estimation of the extent to which the treatment programs themselves might be generating patients' satisfaction with them.

Satisfaction should be a secondary goal of program design; the primary goal should be effective alleviation of symptoms and social dysfunction.

Several limitations to the present study should be borne in mind. First, the total amount of variance in satisfaction ratings that is accounted for by the model is only 8%. This means that other variables not included in the model remain to be identified as major contributors to satisfaction. Such variables that deserve attention in future research are patients' expectations of treatment and their predispositions to be satisfied or unsatisfied in general. A second limitation is the underrepresentation of treatment structure and process features in the model. In addition to the two indices of treatment structure included in this study, there are several other features, such as patient-staff ratio, specific treatment modalities, and social climate, which we would have included if data were available. A wider inclusion of treatment features might increase the percentage of variance

explained by these variables and decrease the percentage explained by patient characteristics. Third, we have evaluated one set of particular relationships in our model. Although this set seems to be the most reasonable to us, based on our current knowledge, other sets also may deserve evaluation, based on their theoretical reasonableness and empirical support. Finally, it is unknown how generalizable the results are beyond veterans being treated for PTSD in DVA specialized inpatient and residential programs. For example, the waiting times for many VA programs may well exceed the range that is characteristic of other health care systems. Although the results are similar in many respects to those from other studies, further comparative research is needed to determine generalizability conclusively.

REFERENCES

- Attkisson, C.C., & Zwick, R. (1982). The Client Satisfaction Questionnaire: Psychometric properties and correlation with service utilization and psychotherapy outcome. *Evaluation and Program Planning*, 5, 233-237.
- Bentler, P.M. (1989). *EQS structural equations program manual*. Los Angeles: BMDP Statistical Software.
- Bollen, K.A. (1989). *Structural equations with latent variables*. New York: Wiley.
- Card, J.J. (1983). *Lives after Vietnam*. Lexington, MA: Heath.
- Carr-Hill, R. (1992). The measurement of patient satisfaction. *Journal of Public Health and Medicine*, 14, 236-249.
- Cronbach, L. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16, 297-304.
- Edwards, D.W., Yarvis, R.M., Mueller, D.P., & Langsley, D.G. (1978). Does patient satisfaction correlate with success? *Hospital and Community Psychiatry*, 29, 188-190.
- Fontana, A., & Rosenheck, R. (1993). A causal model of the etiology of war-related PTSD. *Journal of Traumatic Stress*, 6, 475-500.
- Fontana, A., & Rosenheck, R. (1994). A short form of the Mississippi Scale for measuring change in combat-related PTSD. *Journal of Traumatic Stress*, 7, 407-414.
- Fontana, A., & Rosenheck, R. (1997a). Effectiveness and cost of inpatient treatment of posttraumatic stress disorder. *American Journal of Psychiatry*, 154, 758-765.
- Fontana, A., & Rosenheck, R. (1997b). *Outcome monitoring of specialized intensive PTSD programs: Fiscal year 1996 report*. West Haven, CT: Northeast Program Evaluation Center.
- Fontana, A., Rosenheck, R., Spencer, H., Gray, S., & DiLella, D. (1998). *The long journey home VI: Treatment of posttraumatic stress disorder in the Department of Veterans Affairs—Fiscal year 1997 service delivery and performance*. West Haven, CT: Northeast Program Evaluation Center.
- Fowler, J.F., & Jackson, F. (1991). *Comparing prospective and retrospective: Measures of treatment outcomes*. University of Massachusetts, Boston: Center for Survey Research.
- Foy, D.W., Sippelle, R.C., Rueger, D.B., & Carroll, E.M. (1984). Etiology of posttraumatic stress disorder in Vietnam veterans: Analysis of premilitary, military, and combat exposure influences. *Journal of Consulting and Clinical Psychology*, 52, 79-87.
- Greenwood, N., Key, A., Burns, T., Bristow, M., & Sedgwick, P. (1999). Satisfaction with in-patient services: Relationship to patient and treatment factors. *British Journal of Psychiatry*, 174, 159-163.
- Hatcher, L. (1994). *A step-by-step approach to using the SAS system for factor analysis and structural equation modeling*. Cary, NC: SAS Institute, Inc.
- Hayduk, L.A. (1987). *Structural equation modeling with LISREL*. Baltimore: Johns Hopkins University Press.
- Hermann, R.C., Ettner, S.L., & Dorwart, R.A. (1998). The influence of psychiatric disorders on patients' ratings of satisfaction with health care. *Medical Care*, 36, 720-727.
- Hoff, R.A., Rosenheck, R.A., Meterko, M., & Wilson, N.J. (1999). Mental illness as a predictor of satisfaction with inpatient care. *Psychiatric Services*, 50, 680-685.
- James, L.R., Mulaik, S.A., & Brett, J. (1982). *Causal analysis: Models, assumptions, and data*. Beverly Hills, CA: Sage.

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- Kane, R.L., Maciejewski, M., & Finch, M. (1997). The relationship of patient satisfaction with care and clinical outcomes. *Medical Care*, 35, 714-730.
- Kasprow, W.J., Frisman, L., & Rosenheck, R.A. (1999). Homeless veterans' satisfaction with residential treatment. *Psychiatric Services*, 50, 540-545.
- Kulka, R.A., Schlenger, W.E., Fairbank, J.A., Hough, R.L., Jordan, B.K., Marmar, C.R., & Weiss, D.A. (1990). *Trauma and the Vietnam war generation: Report of findings from the National Vietnam Veterans Readjustment Study*. New York: Brunner/Mazel.
- Laufer, R.S., Yager, T., Frey-Wouters, E., & Donnellan, J. (1981). *Legacies of Vietnam* (House Committee print 14). Washington, DC: U.S. Government Printing Office.
- Lebow, J.L. (1983). Research assessing consumer satisfaction with mental health treatment: A review of findings. *Evaluation and Program Planning*, 6, 211-236.
- Linder-Pelz, S. (1982). Toward a theory of patient satisfaction. *Social Science and Medicine*, 16, 577-582.
- Mardia, K.V. (1970). Measures of multivariate skewness and kurtosis with applications. *Biometrika*, 57, 519-530.
- McLellan, A.T., Luborsky, L., Cacciola, J., Griffith, J., Evans, F., Barr, H.L., & O'Brien, C.P. (1985). New data from the Addiction Severity Index: Reliability and validity in three centers. *Journal of Nervous and Mental Disease*, 173, 412-423.
- Mulaik, S.A., James, L.R., Van Alstine, J., Bennet, N., Lind, S., & Stilwell, C.D. (1989). Evaluation of goodness-of-fit indices for structural equation models. *Psychological Bulletin*, 105, 430-445.
- Pascoe, G.C. (1983). Patient satisfaction in primary health care: A literature review and analysis. *Evaluation and Program Planning*, 6, 185-210.
- Priebe, S., & Gruyters, T. (1995). Patients' assessment of treatment predicting outcome. *Schizophrenia Bulletin*, 21, 87-94.
- Rosenheck, R., Wilson, N.J., & Meterko, M. (1997). Influence of patient and hospital factors on consumer satisfaction with inpatient mental health treatment. *Psychiatric Services*, 48, 1553-1561.
- SAS Institute Inc. (1989). *SAS/STAT user's guide, Version 6, 4th Ed., Vol 1*. Cary, NC: SAS Institute, Inc.